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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/751,439 | 01/06/2004 | Howard E. Rhodes | M4065.0624/P624 | 3917 |

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| EXAMINER | |
|---|---|
| NHU, DAVID | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2818 | |

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/751,439 | RHODES, HOWARD E. | |
| | Examiner | Art Unit | |
| | David Nhu | 2818 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-143* is/are pending in the application.

4a) Of the above claim(s) *3,19,42 and 50-143* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 4-18, 20-41, 43-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

**FINAL**

**DETAIL ACTIONS**

***Election/Restrictions***

*1. Applicant's election of Species I (Claims 1-49) with traverse is acknowledge.*

Claims 1-49 are remained for examination. Accordingly, claims 50-79 are canceled/withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Applicant's election with traverse of **a) Species I, e.g. claims 1-49: A method of forming a pixel cell of an imaging device comprising forming at least one transistor in said pixel cell to have a gate and source/drain regions on opposite sides of said gate, at least one of said source/drain regions having no halo implant, no enhancement implant, no lightly doped drain implant** is acknowledged.

Because Applicant did not distinctly and specifically point out the supposed error in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Applicants have the right to file a divisional application covering the subject matter of the non-elected claims 50-79.

The traversal is on the ground(s) that see the election paper. This is not found persuasive because the fields of search for the plural of species claims are NOT coextensive and the determinations of patentability of the plural of species claims are different, that is the plural of species limitations are given weight differently in determining the patentablitity of the claimed inventions. For example, this application contains claims directed to the following patentably distinct species of the claimed invention:

**b) Species II, e.g. claims 50-60: A method of forming a pixel cell of an imaging device comprising forming at least one transistor over a semiconductor substrate of a first conductivity type, said at least one transistor having a threshold voltage of another transistor of said pixel cell formed over said semiconductor substrate;**

**c) Species III, e.g. claims 61-79: A method of forming a read out circuit for an image pixel cell comprising forming a p-type halo implanted region in said silicon substrate an opposite sides of said row select transistor gate but not on at least one side of said source follower transistor gate; forming n-type source and drain regions on opposite sides of said source follower and row selected transistor gates, so that said source follower and row select transistors have a common source and drain region.**

Therefore, the strategies for doing text searching of the plural of species are different. Thus, separate searches are required.

The requirement is still deemed proper and is therefore made FINAL.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-49 are rejected under 35 U.S.C. 102 (e) as being anticipated by Hong (2005/0040393 A1).

**Regarding claim 1**, Hong (see figures 2A-2B, 4A-4C, col. 2, lines 8-67, col. 3, lines 1-67, col. 4, lines 32-67), teaches a method of forming a pixel cell 300 of an imaging device, said method comprising: forming a photosensitive device 320 in said pixel cell (see figure 4A); and forming at least one transistor 341, 343, 345 in said pixel cell to have a gate 380 and source/drain regions 305, 307 on opposite sides of said gate, at least one of said source/drain regions having no halo implant (see figures 4A having no halo implant), wherein at least one of said source/drain regions 305, 307 have no lightly doped drain (LDD) implant (see figures 4 C having no LDD implant).

**Regarding claim 16**, Hong (see figures 2A-2B, 4A-4C, col. 2, lines 8-67, col. 3, lines 1-67, col. 4, lines32-67), teaches a method of forming a pixel cell 300 of an imaging device, said method comprising: forming a photosensitive device 320 in said pixel cell (see figure 4A); and forming at least one transistor 341, 343, 345 in said pixel cell to have a gate receiving charge 444 from said photosensitive device and source/drain regions 305, 307 on opposite sides of said gate, at least one of said source/drain regions having no enhancement implant (see figure 4B having no enhancement implant), wherein at least one of said source/drain regions 305, 307 have no lightly doped drain (LDD) implant (see figure 4 C having no LDD implant).

**Regarding claim 28**, Hong (see figures 2A-2B, 4A-4C, col. 2, lines 8-67, col. 3, lines 1-67, col. 4, lines 32-67), teaches a method of forming a pixel cell 300 of an imaging device, said method comprising: forming a photosensitive device 320 in said pixel cell (see figure 4 A); forming at least one transistor 341, 343, 345 in said pixel cell to have a gate receiving charge 444 from said photosensitive device and source/drain regions 305, 307 on opposite sides of said gate,

at least one of said source/drain regions having no en lightly doped rain (LDD) implant (see figures 4 C having no LDD implant).

**Regarding claim 40**, Hong (see figures 2A-2B, 4A-4C, col. 2, lines 8-67, col. 3, lines 1-67, col. 4, lines 32-67), teaches a method of forming a pixel cell 300 of an imaging device, said method comprising: forming a photosensitive device 320 in said pixel cell (see figure 4 A); forming a first transistor 341 in said pixel cell to have a first gate receiving charge 444 from said photosensitive device and first source/drain regions 305 on opposite sides of said first gate, and forming a second transistor 345 in said pixel cell to have a second gate for resetting a signal from said first transistor and second source/drain regions 307 on opposite sides of said second gate, at least one of said source/drain regions having no halo implant (see figures 4 A), wherein at least one of said second source/drain regions 307 have no lightly doped drain (LDD) implant (see figure 4 C).

Regarding claims 2, 18, 30, 41, Hong, (see figures 2B), wherein the source/drain regions on either side of said gate have no halo implant.

Regarding claims 3, 19, 29, 42, Hong, (see figures 2 B, 4C), wherein the source/drain regions have no lightly doped drain (LDD) implant.

Regarding claims 4, 5, 17, 43, Hong (see figures 2B, 4A-4C), wherein the source/drain regions have no enhancement implant.

Regarding claims 6, 31, Hong, (see figures 5G-5I), wherein at least one of said source/drain regions 305, 307 consists essentially of a source/drain implant and a LDD implant.

Regarding claims 7, 12, 20, 25, 32, 47, " wherein said transistor is one of a source follower transistor 347, 349...

Regarding claims 8, 21, 33, 44, Hong , (see figures 2A-2B, col. 5, lines 1-7), wherein the pixel cell is one of a 3T, 4T, 5T, 6T, 7T pixel cell.

Regarding claims 9, 22, 34, 45, Hong, (see figures 2A-2B), wherein the transistor has a threshold voltage lower than the threshold of another transistor of said pixel cell.

Claims 13, 26, 38, 48, Hong, (see figures 2A-2B, 4A-4C), wherein the photosensitive device is one of a photodiode 320, photo-gate 330, photoconductor 305.

Regarding claims 14, 15, 27, 39, 49, Hong, (see figures 2A-2B, 4A-4C), wherein the imaging device is one of a CMOS imager or a CCD imager.

Claims 10, 11, 22, 24, 35, 36, 46, Hong fails to teach the threshold voltage of said transistor is in the range of about 0.3 V to about less than 0.7 V.; however, Background of Invention (BOI), pages 4, lines 0011-0020, teaches the threshold voltage of the transistor in the range.

**Response to Arguments**

4. Applicant's arguments filed 3/8/06 have been considered but they are not persuasive.

Contrary to the applicant's argument about claims 1, 16, 28, 40 in his remark, pages 15-17. Applicant argues that Hong does not teach wherein at least one of said source/drain regions have no lightly doped drain (LDD) implant. In fact, Hong teaches at least one of said source/drain regions 305, 307 have no lightly doped drain (LDD) implant (see figure 4 C having NO LDD implant; figure 4 B having NO ENHANCEMENT implant; figure 4 A having NO HALO implant)

**Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Rhodes'839, Rhodes'524, Noble'694, Park'388, Yaung'076 are cited as

of interest.

6. A shortened statutory period for response to this action is set to expired 3 (three) months and 0 (zero) day from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see 710.02 (b)).

7. Any inquiry concerning this communication on earlier communications from the examiner should be directed to David Nhu, (571)272-1792. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. *The fax phone number for the organization where this application or proceeding is assigned is (703)972-9306.*

*Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.*

*Information regarding the status of an application may be obtained from the patent application information retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).*

*David Nhu*

May 16, 2006

Approved 5/12/06

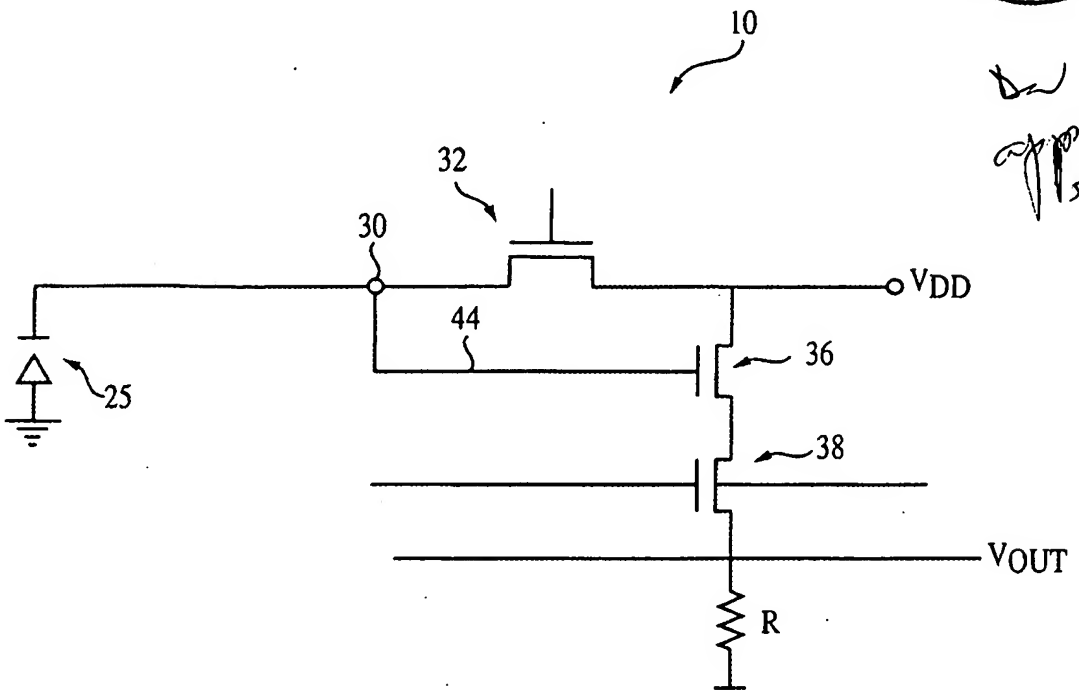


FIG. 1
(PRIOR ART)

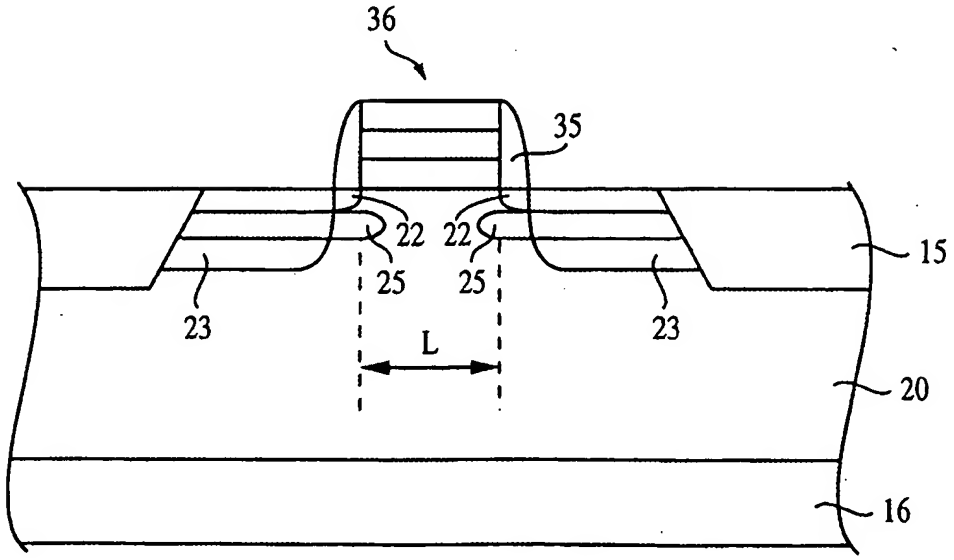


FIG. 2
(PRIOR ART)